

**WHAT IS CLAIMED IS:**

1. A rack-mount server system, comprising:

a plurality of server modules with heat-generating components, said heat-generating components being cooled by a circulating coolant;

a coolant circulation path to which said server modules are connected in parallel and through which the coolant to cool the server modules is circulated; and

a cooling unit connected in the middle of said coolant circulation path, said cooling unit circulating the coolant and cooling said coolant by radiating its heat to the outside air.

2. The rack-mount server system according to claim 1,

wherein said coolant circulation path has a bypass route parallel to said server modules and going around said server modules.

3. The rack-mount server system according to claim 2,

wherein said coolant circulation path has flow quantity control means in said bypass route to control the flow quantity of the coolant circulating in said server modules.

4. The rack-mount server system according to claim 3,

wherein said flow quantity control means increases the flow quantity when reducing the circulation quantity of the coolant to the server modules and said flow quantity control means reduces the flow quantity when increasing the circulation quantity of the coolant to the server modules.

5. The rack-mount server system according to claim 2,  
wherein said server module has flow quantity control  
means in a flow path connected to said coolant circulation path.

5 6. The rack-mount server system according to claim 5,  
wherein said flow quantity control means is provided on  
an inflow side of the coolant circulating in the server module.

7. The rack-mount server system according to claim 2,  
10 wherein the flow quantity of the coolant through the  
bypass route of said coolant circulation path is controlled to  
change the flow quantity of the coolant circulating in said  
plurality of server modules.

15 8. The rack-mount server system according to claim 1,  
wherein each of the server modules has flow quantity  
control means of the coolant in a part of the coolant  
circulation path to cool the server modules.

20 9. The rack-mount server system according to claim 8,  
wherein said flow quantity control means is provided on  
an inflow side of the coolant circulating in the server module.

10. The rack-mount server system according to claim 1,  
25 wherein joints with automatic valve are provided, with  
which an inlet and an outlet of the coolant circulating in said  
server modules to cool the heat-generating components are  
connected to said coolant circulation path.

11. The rack-mount server system according to claim 10,  
wherein said joints with automatic valve are arranged in  
accordance with mount pitch of the server modules to be mounted  
in the rack-mount server system.

5

12. The rack-mount server system according to claim 10,  
wherein said joints with automatic valve are provided so  
that the connecting/disconnecting direction of the joints  
corresponds to the mounting direction of the server module.

10

13. The rack-mount server system according to claim 1,  
wherein said cooling unit measures the temperature of the  
coolant discharged to said coolant circulation path and cools  
the coolant discharged to said coolant circulation path to a  
predetermined temperature, and

15

the server module controls the flow quantity of the  
coolant supplied from said coolant circulation path so that the  
temperature of the heat-generating components cooled by  
circulating the coolant reaches a predetermined temperature.

20

14. The rack-mount server system according to claim 1,  
wherein said cooling unit is provided at the top of the  
rack cabinet of the rack-mount server system.

25

15. The rack-mount server system according to claim 1;  
wherein the flow quantity of the coolant discharged from  
said cooling unit to said coolant circulation path is larger  
than the sum of the flow quantities of the coolant circulating  
in the plurality of server modules connected to said coolant

circulation path.

16. A rack cabinet of a rack-mount server system in which a plurality of server modules having heat-generating components  
5 such as CPU are mounted, comprising:

a coolant circulation path to which said server modules are connected in parallel via joints and through which a coolant to cool the server modules is circulated; and

a cooling unit connected in the middle of said coolant  
10 circulation path, said cooling unit circulating the coolant and cooling said coolant by radiating its heat to the outside air.

17. The rack cabinet according to claim 16,  
wherein said coolant circulation path is arranged  
15 vertically along the cabinet, and

said coolant circulation path is arranged on the side of a cable space of the mounted server module.

18. The rack cabinet according to claim 16,  
20 wherein said cooling unit is provided at the top of the rack cabinet.

19. The rack cabinet according to claim 16,  
wherein said cooling unit includes a refrigerating unit  
25 to radiate the heat generated in the server module and absorbed in the coolant to the outside air.

20. The rack cabinet according to claim 19,  
wherein a radiator of said refrigerating unit is cooled

by the cooling air flowing in the front/rear direction of the cabinet.

21. The rack cabinet according to claim 19,

5 wherein said joints are arranged in accordance with mount pitch of the server modules mounted in the rack cabinet.

22. The rack cabinet according to claim 16,

10 wherein said joints are provided so that the connecting/disconnecting direction of said joints corresponds to the mounting direction of the server module.

23. The rack cabinet according to claim 22,

15 wherein said joint includes an automatic valve.

24. A server module with a heat-generating component such as CPU in a rack-mount server system, comprising:

a first heat-generating component cooled by a coolant supplied from a cooling unit of a rack cabinet; and

20 a second heat-generating component cooled by the cooling air passing through the server module.

25. The server module according to claim 24,

25 wherein said second heat-generating component is arranged in a front part of the module from which the outside air is delivered, and

said first heat-generating component is arranged in a rear part of the module to and from which said coolant is supplied and drained.

26. The server module according to claim 24,

wherein said server module further comprises: joints directed in the mounting direction of the server module, through which the coolant to cool said first heat-generating component is supplied and discharged.

27. The server module according to claim 26,

wherein said joint includes an automatic valve.

28. The server module according to claim 24,

wherein flow quantity control means to control the flow quantity of the coolant to cool said first heat-generating component is provided on an inflow side of said coolant.

29. The server module according to claim 28,

wherein said flow quantity control means controls the flow quantity so that the temperature of said first heat-generating component reaches a predetermined temperature.